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Weekly Bulletin

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EDITOR

The Diagnosis and Treatment of Epidemic Poliomyelitis

(Continued from last issue.)

The patient should be handled in a gentle manner, and every effort made to dispel his fear—which is sometimes difficult—and to minimize his activity. General care is similar to that applied to the common, mild acute infections; diet and elimination present no great problem and, in these early preparalytic cases, restlessness and irritability are seldom difficult to control. All accounts of modern epidemics indicate that, with the application of only these simple measures, one need not expect a high incidence of paralytic or fatal sequelae, and that, as our efforts increase in detecting the disease early and treating it thus simply, we may expect the prognosis steadily to improve.

TREATMENT OF PARALYSIS

In the majority of cases typical weakness of skeletal muscles, if evident at all, appears on the third or fourth day of the fever, although occasionally it puts in its appearance after a prolonged febrile course. In only one form of the disease does paralysis characteristically come early, and this is the so-called bulbar (actually bulbo-pontine) form in which weakness of the muscles supplied by the cranial nerves may be detected almost at the onset of the fever. Involvement of the muscles of the eye, the face, of mastication, of swallowing and phonation, should always be sought for and promptly recognized. These signs indicate a form of the infection most immediately dangerous to life; but with the best prognosis for complete recovery if survival occurs.

The diagnosis may frequently be made through the observation of a collection of saliva in the back of the throat, which indicates the inability of the patient to swallow. Serious progression may rapidly ensue, and a considerable proportion of poliomyelitis deaths are caused by central respiratory failure, which amounts to a complete disorganization of respiratory function. This central type of respiratory failure is amenable only to a very small extent to the use of the respirator; the patient breathes irregularly, adapts himself poorly to the rhythm of the machine, is unable to free his air passages from secretion; and aspiration pneumonia frequently complicates the picture. Respiratory stimulants are, naturally, of little avail. With evident involvement of swallowing and respiration, the patient should be placed on his face, the foot of the bed elevated, and suction should be used to clear the air passages. This patient should not be fed by gavage during the active course, but should be supported by the parenteral administration of fluids and dextrose. When failure of respiration impends, the respirator should be tried; it may even be justifiable to suppress the patient's incoordinated respiratory efforts, hiccoughs, etc., by the use of fairly large doses of morphin, while the use of the machine is being instituted. Usually, the course of cranial-nerve paralysis is short: death quickly ensues or the patient speedily recovers function to a considerable degree. When cranial nerve involvement is

accompanied by skeletal involvement, the latter should also be appropriately dealt with.

Skeletal Muscle Weakness.—The appearance of skeletal muscle weakness should be carefully sought during the active stage of the disease. Adequate examinations can be conducted daily with a minimum of disturbance. Complete examination may be best carried out only at several repeated visits. The detection of actual muscle weakness is of far greater importance than meticulous examination of the reflexes. As soon as there is the slightest amount of muscle weakness the involved extremity should be supported at rest in a position which protects the damaged function from the effects of gravity and the pull of opposing muscles. Temporarily, during the early stage, the arms may be supported by means of pillows or slings attached to the head of the bed. The legs may be temporarily supported by sand bags or pillows. The muscles of the trunk require only the recumbent posture during the early stage. It is of extreme importance that these measures of support be instituted at the earliest possible moment. Despite all that has been said about this matter, slight muscle weakness all too frequently goes unrecognized or persists untreated until the end of the quarantine period, with immeasurable harm to the ultimate prognosis. Makeshift methods, sand bags, pillows, and slings should quickly be superseded by methods of support of better design. Many of the orthopedists prefer lightweight splints because of the ease with which they can be applied or removed. A likely preference is for very lightweight plaster casts, which can quickly be abbreviated to a half shell and, while lacking the advantage of easy application, have at the same time the advantage that they are not apt so frequently to be removed. These measures for support do not demand superior skill although, if the orthopedist is to assume the later care of the patient, he should properly be consulted at an early stage so that the patient may receive the advantage of continuity of treatment.

Pain.—Pain is a common concomitant of the paralytic stage and its relief is difficult. Barbiturates are not conspicuously successful and narcotics are to be avoided. The application of heat, in any manner, is productive of increased comfort, and radiant heat is especially helpful. Sedation is best secured by trial of a variety of agents, including hypnotics, sedatives, and narcotics; and paraldehyd given by mouth or by rectum is very helpful.

Respiratory Weakness.—Respiratory weakness is frequently referred to as bulbar paralysis, but this term is often erroneously applied, inasmuch as the

common form of respiratory involvement concerns the innervation of the intercostal muscles and the diaphragm, and is less likely to be due to central involvement. When there is involvement of one or both shoulder girdles, respiratory weakness should expectantly be watched for. This may develop most insidiously; there is a gradual diminution of chest excursion and increasing loss of ability to maintain the expansion of the chest against the pull of the diaphragm. Evident respiratory distress is usually lacking, although the patient shows increasing anxiety; the increased activity of the diaphragm leads to progressive diaphragmatic fatigue which may terminate abruptly with cessation of breathing. These typical cases respond well to the action of the respirator; the patient should be placed in the machine early, before there is complete failure, to become, usually, immediately comfortable. The machine simulates closely the physiology of breathing, and acts to some extent like a splint in that it spares the damaged respiratory muscles overfatigue. The respirator can maintain function only as a temporary expedient until subsidence of active disease permits restoration of all or part of the damaged respiratory function, which occurs in a surprising proportion of cases. That function does not invariably return is no fault of the method; the minority of cases in which normal respiration is not resumed to some extent, and in which the respirator simply prolongs a miserable existence, is an unfortunate occurrence which is compensated for by many in which this function does return and the patient finally enjoys restoration to a useful existence. It is almost obligatory that the patient in the respirator be handled by those adequately skilled in its operation, and the cooperation of a skilled team should always be developed for this purpose. It is more than a trick to be able to place the patient in the machine deftly and to care for his wants, nutrition, prevention of decubitus, elimination, etc., while he is totally dependent on his attendants.

In most instances the respirator should be operated with a negative pressure of 14-16 cm. of water and a rate of 16 per minute. Positive pressure is seldom necessary and usually causes discomfort. In exceptional cases the rate and pressure relations will have to be varied to suit the comfort and needs of the patient. A great deal is to be found out about the respirator only by experience.

Bladder and Bowel Weakness.—Bladder and bowel weakness commonly accompany weakness of the muscles of the lower abdomen and back, and unless adequate precautions are taken to prevent it, diffi-

cult defecation will be complicated by the accumulation of masses of impacted feces which are difficult to remove. Catharsis is less helpful than the use of lubricants, supplemented by gentle flushing and enemas of the lower bowel. Bladder weakness, formerly believed to be unusual in poliomyelitis, is not uncommon. Opinion is divided whether these patients should be catheterized or permitted reflex emptying; but, despite the danger of bladder infection (which commonly supervenes) it is probably better to employ catheterization to relieve distention. As a rule, bladder function quickly returns, usually within a week after defervescence.

COMMENT

All of the useful methods of the acute stage should be continuously employed, and three to six weeks after onset a slow return to activity and painstaking reeducation of damaged function should be started. This should be carried out under the best orthopedic and physiotherapeutic supervision obtainable, and should proceed on the basis of an accurate estimate of muscle function with an appropriately planned program. The final outcome is almost invariably better than the condition at the height of the disease, and slow improvement may be expected under proper care for one, two, or three years. Physiotherapy in the pool is of great advantage, despite the fact that it is popularly overrated. Its chief value is that of permitting muscular activity without weight bearing, thus facilitating reeducation of damaged, but not destroyed, function. There should be no hard and fast rule about the time for substitution of surgical procedures for conservative treatment; when weakness does not cause deformity and impairment of surviving function, conservative measures may be hopefully continued for a long time; but where persistent weakness leads to severe and intractable deformity, as in involvement of back and trunk muscles, it may be advisable to intervene surgically very early.

The proved essentials of the treatment of poliomyelitis depend on simple principles which should be recognized by all practitioners; their proper employment taxes the art of medicine to the extreme. Final prognosis is best served by an early diagnosis, a persistent application of simple orthopedic procedures for protection against deformity and disability, and the patient's persistence in reeducation and rehabilitation of the patient, which must include an effort to maintain in every way his morale and cooperation.

SERUM TREATMENT

The therapeutic value of immune serum is at present unproved and no obligation rests on the

physician to employ it. Most of the favorable reports have not been controlled by the simultaneous observation of untreated patients and from those studies in which approximately equal numbers of treated and untreated patients have been observed, no statistical evidence has been found in favor of serum. Nevertheless, the question can not be regarded as finally settled; the use of larger amounts of serum (carefully processed) than have been ordinarily used, especially when its content of poliocidal antibodies is known to be high, is harmless and may well deserve further investigation. For this purpose, pooled human serum of known high titer, whether from normal persons or convalescents in amounts of at least 100 c.c. and up to 200 c.c., given intramuscularly or intravenously during the preparalytic stage is advised. Such serum should be obtained from a laboratory specializing in its collection and preparation and authorized by the State Board of Health.

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FOOD AT STATE INSTITUTIONS

Considerable time has been spent by food and drug inspectors in the cooperative work of inspecting state institutions on request of Governor Culbert L. Olson. Shipments of foods at San Quentin have been inspected, samples of food prepared and served there were taken to the laboratory for analysis and considerable time has been spent in the drawing up of specifications and plans relating to certain changes to be made at San Quentin relative to the preparation and serving of food. Prices, quotations and other data have been compiled relative to these matters and have been submitted to the proper authorities.

TOMATO CANNING INCREASES

The commercial packing of tomatoes increased considerably during August. The system of inspection is the same as that used last season, with a full-time tomato inspector stationed at each cannery. He has supervision over the grading of each truck load of tomatoes brought to the cannery. The provisions of the State Agricultural Code apply, and if the fruit does not meet requirements, it is returned to the grower for sorting. Grading certificates are issued to the grower to show the condition of the tomato. The inspector also inspects tomatoes within the cannery on the sorting belts and trimming tables, and is made responsible for the use of only sound material in the canning processes.

MORBIDITY**Complete Reports for Following Diseases for Week Ending September 16, 1939****Chickenpox**

50 cases: Alameda 4, Berkeley 1, Oakland 3, Oroville 1, Humboldt County 1, Imperial County 1, Bishop 1, Los Angeles County 1, Long Beach 1, Los Angeles 5, Orange County 9, Sacramento County 2, Oceanside 1, San Diego 2, San Francisco 10, Santa Barbara 2, San Jose 1, Shasta County 1, Siskiyou County 1, Woodland 2.

Diphtheria

15 cases: San Leandro 1, Fresno County 1, Kern County 1, Los Angeles County 2, Los Angeles 3, Madera County 1, Colton 2, Escondido 1, San Diego 1, Ventura County 2.

German Measles

9 cases: Oakland 1, Los Angeles County 1, Los Angeles 1, Santa Monica 1, South Gate 1, Maywood 1, Santa Ana 1, San Bernardino 1, Tulare County 1.

Influenza

10 cases: Oakland 1, Los Angeles County 2, Los Angeles 3, Monterey County 1, Orange County 1, San Bernardino County 1, National City 1.

Malaria

9 cases: Kern County 2, Long Beach 1, Merced County 1, Upland 1, Yuba County 4.

Measles

42 cases: Contra Costa County 1, Los Angeles County 5, Glendale 1, Los Angeles 2, Pasadena 1, Merced County 1, Anaheim 1, Fullerton 1, Sacramento 1, Redlands 1, San Diego County 1, San Diego 9, San Francisco 2, San Joaquin County 1, Stockton 5, Redwood City 1, Santa Barbara County 1, Santa Barbara 1, Santa Clara County 1, Tulare County 3, Oxnard 1.

Mumps

157 cases: Alameda County 3, Alameda 1, Berkeley 5, Oakland 2, Fresno County 1, Fresno 1, Kern County 1, Bakersfield 3, Los Angeles County 4, Glendale 5, Long Beach 2, Los Angeles 14, Monrovia 1, Pasadena 2, Santa Monica 4, Madera County 5, Chowchilla 1, Mill Valley 2, San Anselmo 4, Orange County 4, La Habra 2, Plumas County 2, Sacramento 2, San Benito County 1, San Bernardino County 1, Ontario 1, San Diego 2, San Francisco 17, San Joaquin County 1, Stockton 20, Tracy 1, San Luis Obispo County 8, San Luis Obispo 1, Santa Barbara County 1, Santa Clara County 1, Palo Alto 13, San Jose 2, Santa Cruz County 1, Shasta County 10, Tehama County 1, Tulare County 1, Exeter 1, Visalia 1, Davis 1.

Pneumonia (Lobar)

26 cases: Oakland 3, Los Angeles County 1, Long Beach 1, Los Angeles 5, Monrovia 1, Monterey County 1, Orange County 1, Sacramento County 1, Sacramento 1, Colton 1, Upland 1, Escondido 1, National City 1, San Francisco 5, Tulare County 2.

Scarlet Fever

73 cases: Alameda County 1, Contra Costa County 1, Fresno County 2, Fresno 1, Holtville 1, Bishop 1, Los Angeles County 10, Avalon 3, Burbank 1, Long Beach 3, Los Angeles 21, Madera County 2, Merced County 1, Merced 1, Orange County 1, Riverside County 1, San Bernardino County 2, San Diego County 3, San Diego 1, San Francisco 4, Stockton 1, San Luis Obispo County 1, Paso Robles 1, Santa Clara County 1, San Jose 2, Santa Clara 1, Vallejo 1, Sutter County 1, Tulare County 1, Ventura County 1, Oxnard 1.

Smallpox

No cases reported

Typhoid Fever

9 cases: Alameda County 1, Bishop 1, Los Angeles 1, South Pasadena 1, Orange County 1, Riverside County 1, California 3.*

Whooping Cough

90 cases: Contra Costa County 2, Los Angeles County 8, Compton 5, Long Beach 6, Los Angeles 16, Pasadena 2, Pomona 1, South Gate 1, Gustine 5, Napa 2, Fullerton 1, Santa Ana 1, Banning 1, San Bernardino County 1, San Diego 5, San Francisco 7, San Joaquin County 1, San Bruno 3, Sutter County 15, Tulare County 5, Oxnard 2.

Dysentery (Amoebic)

5 cases: Ontario 2, Upland 1, Shasta County 1, Tulare County 1.

* Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

Dysentery (Bacillary)

14 cases: Fresno County 1, Kern County 1, Los Angeles County 2, Los Angeles 2, Sacramento 1, Ontario 1, San Francisco 1, Shasta County 5.

Pellagra

2 cases: Los Angeles County 1, Sierra Madre 1.

Poliomyelitis

51 cases: Fresno County 1, Fresno 2, Los Angeles County 4, Azusa 1, Burbank 1, Glendora 1, Long Beach 3, Los Angeles 16, Hawthorne 1, Tustin 1, Sacramento 1, San Benito County 1, Hollister 1, San Bernardino County 2, Colton 1, Ontario 1, San Diego County 2, La Mesa 1, National City 1, San Francisco 3, San Joaquin County 1, Paso Robles 1, Redwood City 1, Los Gatos 1, Palo Alto 1, Santa Clara 1.

Tetanus

2 cases: Ukiah 1, Tulare 1.

Jaundice (Epidemic)

1 case: Shasta County.

Food Poisoning

2 cases: Los Angeles County.

Undulant Fever

3 cases: Contra Costa County 1, Colton 1, Tulare 1.

Coccidioidal Granuloma

2 cases: Madera County 1, Vallejo 1.

Septic Sore Throat

2 cases: Berkeley 1, Madera 1.

Relapsing Fever

2 cases: San Bernardino County.

Rabies (Animal)

7 cases: Calexico 1, Long Beach 1, Los Angeles 3, San Mateo County 1, Colma 1.

The required methods of work are no secret; for they have been employed by thinking individuals ever since the time of Socrates. Here one can not build without laying foundations. One can not, for example, be a radio expert without the principles of electricity. One can not be a business expert without economics. One can not be an engineer without getting a knowledge of mathematics. Thus it runs throughout the cycle of subjects. Successful work is a kind of development; so before going far one must master its preliminary and prerequisite stages. There is no other valid way. One can not build a tower without first laying a solid foundation.

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